Engineer's Report

September 9, 2020

Normandale Lake Water Quality Improvement Project:

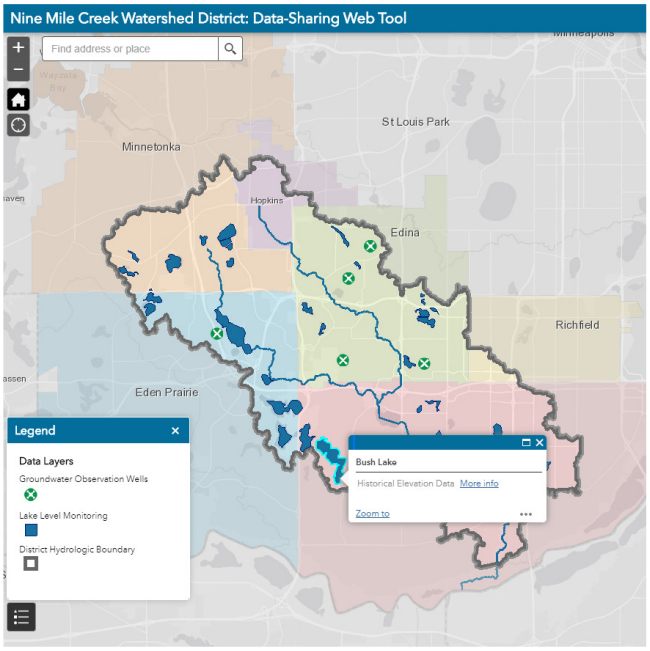
We continue to assist District staff in responding to questions and requests for information regarding water quality in Normandale Lake and the Normandale Lake Water Quality Improvement Project.

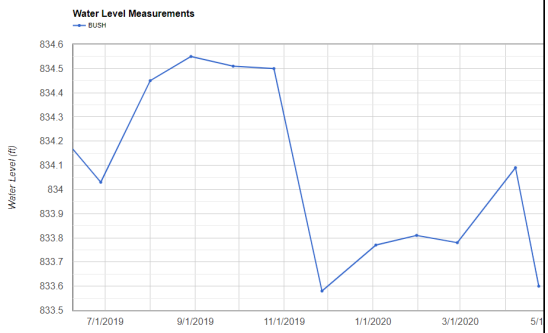
Edina Stream Stabilization Project:

There were no new construction/maintenance activities associated with the project. We have asked Landbridge to provide a cost estimate for extending their maintenance work for additional six months into 2021 to line-up with the completion of the maintenance work for Phase 2 of the project. We received the cost estimate on September 6th and are currently reviewing their proposal.

Development of Data-sharing Web Map Tool:

Updates to the design and functionality of the web mapping application continue. Maintenance and updates to the database are ongoing as water level data is recorded.





Discovery Point Restoration:

Barr has been coordinating with Landbridge Ecological for the Discovery Point landscape management for 2020. Landbridge continued on-site management of exotic species during the month of August.

Discovery Point Building Addition:

A request for quotes for the reconstruction of the northwest rain garden and site improvements associated with the ongoing building addition were sent to five landscaping contractors, with quotes due by June 12th. One quote was received for $58,504.34, which was well above the engineer's estimate of cost. The quote was rejected by the Board because of price at the NMCWD regular meeting in June. Quotes will be requested again in the fall for work to be completed in the spring.

Bush Lake Shoreline Vegetation Management:

Barr has been coordinating ongoing shoreline vegetation management activities with the restoration contractor Landbridge. Barr will continue to monitor management activities performed and make recommendations based on the site conditions throughout the summer of 2020. Purple loosestrife, and reed canary grass were key species targeted for management during the month of August.

Vegetation along the shoreline of Bush Lake.

Vegetation along the shoreline of Bush Lake.

BMP Retrofits on Nonprofit Sites- Final Design and Construction:

All the rain gardens have been completed and final approvals for substantial completion are being coordinated. Feedback from the church officials has been positive as Sunram and their planting subcontractor begin the plant establishment and warranty phase of the project. The contractor is responsible for weeding the gardens as well as cleaning out any built-up sediment in the step-down inlet structure for one year after substantial completion. All plants will be guaranteed for the warranty period. Sod around each garden is warranted for 60 days.

Smetana Lake Use Attainability Analysis Update: Barr has completed updating the Smetana Lake Use Attainability Analysis (UAA) to assess current water quality and re-evaluate implementation recommendations from the original UAA study completed in 2003. Results of the study and management recommendations were presented to the NMCWD Board of Managers at the February 6, 2020 special meeting.

Minor revisions to the draft report are underway. A revised copy will be shared with the City of Eden Prairie to solicit feedback.

Lake Cornelia and Lake Edina Water Quality Improvements: *Aluminum Treatment*

An alum treatment of Lake Cornelia was completed in mid-May. Water quality monitoring of Lake Cornelia is ongoing throughout the 2020 summer months.

Monitoring results from August identified high phytoplankton (algae) concentrations in the lake. Further analysis determined that blue-green algae (cyanobacteria) were the dominant algal species in the lake, with the water samples collected on August 17, 2020 indicating blue-green algae numbers were higher than the World Health Organization (WHO) threshold of 100,000 per mL for moderate probability of adverse health impacts (approximately 231,000 per mL and 211,000 per mL in North and South Cornelia, respectively). Notification of the potential for harmful blue-green algae was provided to the City of Edina and posted on the District's website. Additional water samples were collected from Lake Cornelia on September 8, 2020; phytoplankton identification and enumeration is underway to evaluate whether blue-green algae counts have since dropped below the WHO threshold for moderate probability of adverse health impacts.

The high phytoplankton concentrations prompted questions regarding water quality in Lake Cornelia as it pertains to past years and the spring 2020 alum treatment. Upon review of the available water quality data, it appears that despite the algal bloom, total phosphorus concentrations were generally lower in North and South Cornelia in 2020 compared to historical conditions. Although chlorophyll *a* concentrations in mid-July and early August were high in South Cornelia, maximum and average chlorophyll *a* were lower in 2020 compared to most monitored years since 2004. For North Cornelia, the average chlorophyll *a* in 2020 was typical of past years. After reviewing the historical monitoring data, it can be seen that it is difficult to separate the effect of the alum treatment from natural variability in water quality in Lake Cornelia. It is also difficult to determine whether the phosphorus reductions observed so far in 2020 are a result of the alum treatment without further analysis, which would include modeling. The water quality review for Lake Cornelia as it pertains to past years and the spring 2020 alum treatment is summarized in a memo from Barr dated September 9, 2020 (also included with materials for the District's September 16, 2020 board meeting).

Lake Cornelia and Lake Edina Water Quality Improvements: *Rosland Park Stormwater Filtration BMP*

At the August 19, 2020 regular meeting, the Board ordered the Rosland Park Stormwater Filtration BMP project, authorizing Barr to proceed with project design. The Rosland Park Stormwater Filtration BMP was recommended in the June 2020 *Lake Cornelia and Lake Edina Water Quality Improvement Project Feasibility Study/Preliminary Engineering Report*.

As proposed, the Rosland Park Stormwater Filtration BMP project includes pumping water from Swimming Pool Pond to a stormwater filtration vault after it rains until water levels are about 3½ inches below normal. Since Lake Otto and Swimming Pool Pond are connected by large storm pipes under Highway 62, water levels between the two water bodies are typically equalized. Therefore, pumping from Swimming Pool Pond will also affect water levels in Lake Otto. Coordination is ongoing to evaluate different pumping scenarios to balance project objectives with resident concerns related to Lake Otto water levels and permitting requirements.

Barr facilitated a meeting with the City of Edina and Minnesota Department of Natural Resources (MDNR) to describe the project design to the agencies and gain feedback to inform permitting on September 4, 2020. We anticipate receiving confirmation from MnDNR regarding required project permits in the next week. We have begun initiating design efforts and anticipate collecting geotechnical data (soil borings) to support design in the upcoming weeks. We will also be a considering a design modification in which water could be pumped to the BMP from Lake Cornelia (versus Swimming Pool Pond) during dry climatic periods when pumping from Swimming Pool Pond would be prohibited.

Rendering of proposed stormwater filtration vault in Rosland Park to treat water from Swimming Pool Pond before it flows to Lake Cornelia.

Atlas 14 Model Updates:

At the May 20, 2020 regular meeting, the Board approved a scope of work for Barr to complete updates to the NMCWD's watershed-wide Xp-SWMM model, including incorporating recent Atlas 14 updates completed by the cities of Edina, Richfield, Bloomington, and Minnetonka and review and revising model inputs (e.g., watershed divides and storm sewer information) for Eden Prairie and Hopkins (as needed).

We have received the requested GIS storm sewer and other data from the cities of Eden Prairie, Hopkins and Richfield, and have been updating the model in those areas. We also received requested storm water infrastructure data (GIS data, construction drawings) from Hennepin County for county roadways within Eden Prairie. We have been updating the model in Eden Prairie, Hopkins, and Richfield and have begun combining the Xp-SWMM models throughout the remainder of the watershed.

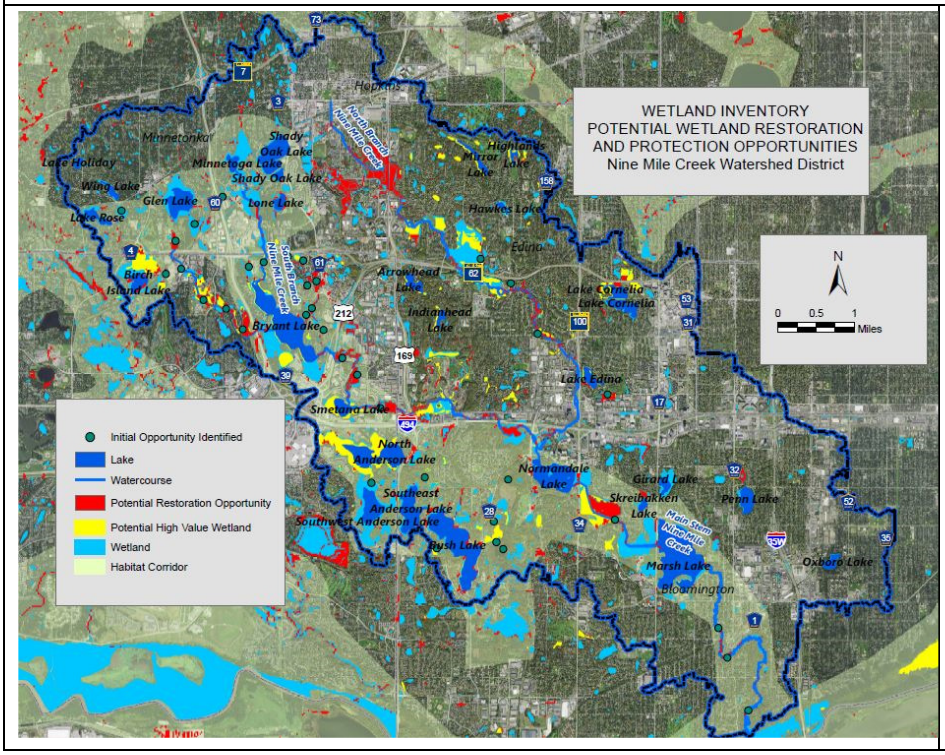
Wetland Restoration and Protection Opportunity Identification:

During development of the NMCWD 2017 Water Management Plan, the NMCWD Board of Managers, local cities, and other stakeholders identified wetland protection as an important issue and identified the following specific priority issues/opportunities related to wetland protection:

- Inventorying and assessing wetlands within the Nine Mile Creek watershed for function and value.
- Preserving the quality of existing wetlands and protecting high quality wetlands.
- Seeking opportunities to restore degraded wetlands.
- Improving wetland health by promoting diversity and abundance of native aquatic species and improving habitat.

In 2020, the NMCWD budgeted for a wetland restoration and protection opportunity study as a first step to 1) compile the best available information regarding wetlands within the Nine Mile Creek watershed, 2) use that information to identify high-value wetlands and/or wetlands with rare and high-quality wetland biological communities in the watershed, and 3) identify the highest-priority opportunities for wetland restoration or protection. Barr staff have begun compiling an inventory of "best available" wetland information, based on the latest National Wetland Inventory (NWI) data, wetland information (delineations and/or function and value assessment information) received through the NMCWD permitting program, and information available from the cities within the watershed. We have been meeting with each city to inform them of the ongoing study and incorporating relevant data they have shared to help inform the study.

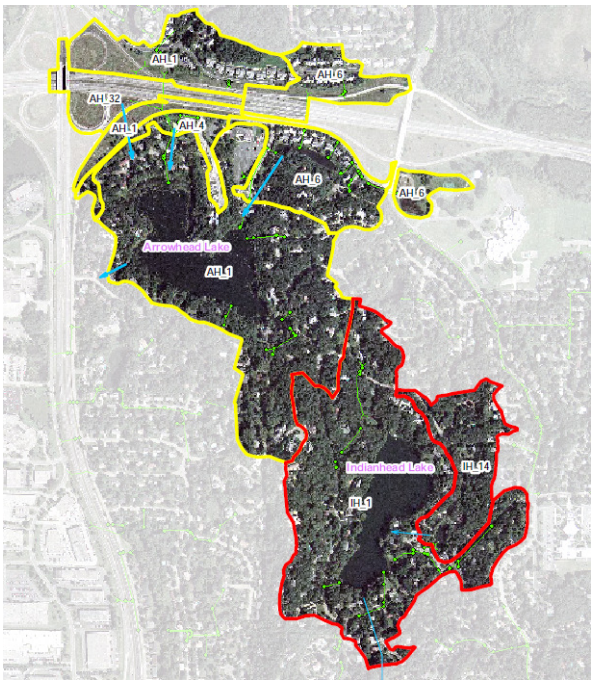
We have also begun identifying the high priority opportunities for wetland preservation, restoration, or protection and prepared a presentation for the September 3, 2020 Board of Managers special meeting. Barr will continue working on this project based on guidance and comments received during this meeting.



Preliminary identification of potential high value wetlands and wetland restoration and protection opportunities within the Nine Mile Creek watershed.

Lake Level Management Plans for Arrowhead and Indianhead Lakes:

The water balance models for these two landlocked lakes have been completed. Calibration of the models leads us to believe that groundwater levels have a strong influence on the potential for high water conditions at these landlocked lakes. We hope to meet with the City of Edina and District staff soon to discuss what we are learning from the study, the results of their elevation survey, and to agree on the goals for lake level management. This will position us for the next step in the project – developing "triggers" to help define when action is needed in order to minimize the risk of flooding for the residents. The ultimate aim is to develop a management plan that will protect the houses around the lakes without adding water to Nine Mile Creek during periods of high flows.



Screenshot at right of an aerial photo showing land use, with superimposed subwatershed divides for Arrowhead and Indianhead Lakes.

Below, observed and modeled lake levels and rainfall data for Arrowhead Lake water balance model.

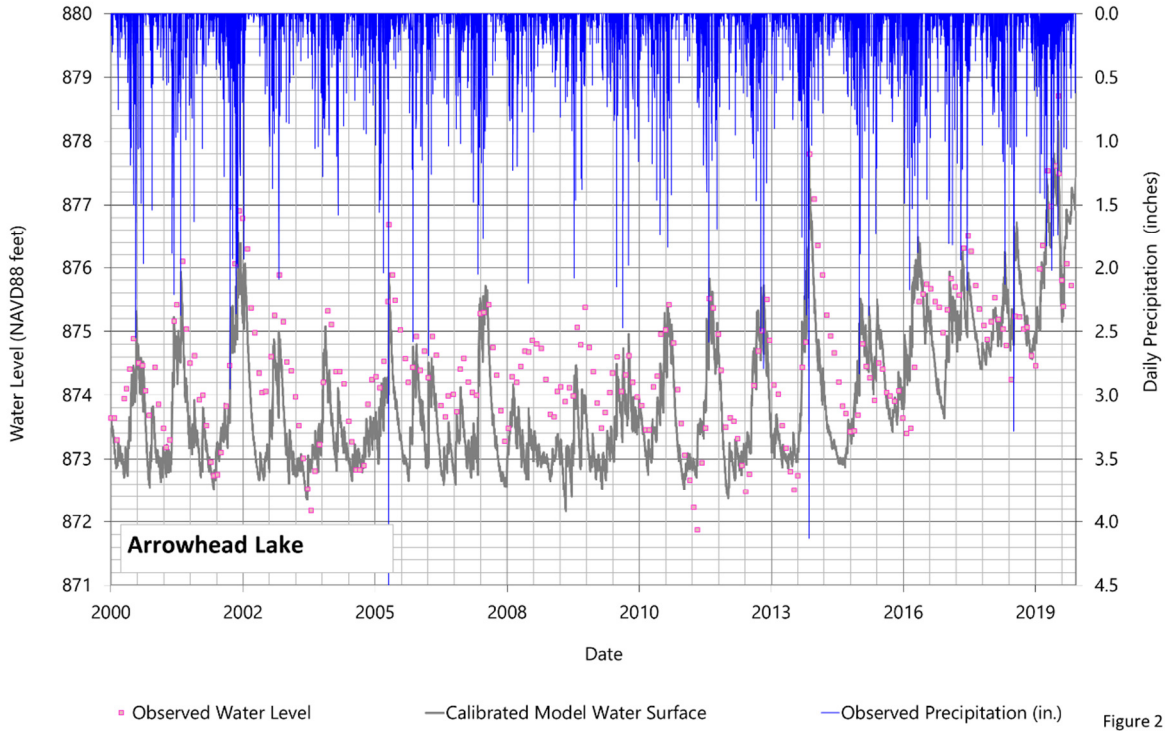


Figure 2

Lower Valley Stabilization:

Work on the two maintenance and repair locations in the most downstream section of Nine Mile Creek in Bloomington has been substantially completed. City of Bloomington staff continue to monitor the site, as needed.

Regional Stormwater Volume Reduction Opportunity Study: No new activities.

Pentagon Park Stormwater Management: No new activities.

Wetland Conservation Act (WCA) and NMCWD Wetland Rule Administration:

Work administering the WCA and NMCWD wetland rule in the past month included:

- conducting site review in response to reported sediment release in NM-EP-01 and preparing determination notice of temporary wetland impact extension for NM-EP-08 (SW LRT)
- preparing WCA Notice of Decision for TRPD Nine Mile Creek Trail extension under TH 169 and responding to questions
- reviewing wetland replacement monitoring report for Braemar Golf Course (2015), communicating with consultant regarding follow up actions, scheduling, and preparing for a WCA TEP site review
- preparing for and participating in wetland bank meeting regarding Hennepin County Home School site
- reviewing wetland replacement monitoring report for Creek Valley Elementary Tennis Courts (Edina Public Schools), scheduling and preparing for a WCA TEP site review
- coordination, preparation for, and participation in TEP meeting regarding wetland disturbance at Tiller Corporation in Eden Prairie and evaluating WCA response
- reviewing wetland delineation report and submitting WCA Notice of Application for Highland Lake East Basin (Edina)
- communication regarding wetland impacts and documentation of previous wetland replacement through UHG (West 62nd Street, Eden Prairie) and reviewing draft wetland application
- reviewing wetland information and participating in a pre-application TEP meeting for the proposed Shady Oak Lake outlet in Minnetonka
- other miscellaneous program administration